AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A device, comprising:

a power source and a load; and

a power converter unit including a processor and a plurality of converter modules, wherein the processor dynamically optimizes the power converter unit to maximize the efficiency of the transfer of energy from the power source to the load by continuously monitoring and balancing one or more varying dynamic parameters.

2. (Original) The device according to Claim 1, wherein the power converter unit is a two phase DC/DC hard-switch converter.

3. (Original) The device according to Claim 2, wherein the hard-switch converter is selected from the group consisting of buck converters, boost converters, buck-boost converters, fly-back converters, forward converters, and push-pull converters, half bridge converters, full bridge converters.

4. (Cancelled)

5. (Currently Amended) The device according to Claim 1 [[4]], wherein the processor includes a software-based program that monitors, calculates, and compares varying dynamic parameters that affects the efficiency of the power converter supplying energy to the load.

6. (Original) The device according to Claim 5, wherein the device further comprises a lookup table stored internal or external to the microprocessor, wherein the lookup table includes pre-programmed or dynamically-created information based upon the monitored parameters.

7. (Original) The device according to Claim 5, wherein the processor calculates efficiency by receiving the average input and output voltage from input and output voltage sensors and average input and output current from input current sensors to calculate input and output power, respectively.

8. (Original) The device according to Claim 7, wherein the processor monitors and compares output power in view of an operating system power level to determine the number of modules to be activated to provide maximum efficiency.

9. (Original) The device according to Claim 7, wherein the processor adjusts frequency of the device to provide maximum efficiency.

10. (Previously Presented) The device according to Claim 7, wherein the processor monitors temperature in each module and continuously adjusts duty cycle until the temperatures in each module are the same.

11. (Previously Presented) The device according to Claim 7, wherein the processor monitors average output currents of the modules and continuously adjusts duty cycle of the system until the currents in each module are the same.

12. (Previously Presented) A method comprising the steps of:

dynamically optimizing a power converter unit including a processor and a plurality of modules;

monitoring and comparing output power in view of an operating system power level to determine the number of modules to be activated to provide maximum efficiency; and

maximizing efficiency of the power converter supplying energy to a load.

13. (Original) The method according to Claim 12, further comprising the step of providing a software-based program that monitors, calculates, and compares varying dynamic parameters that affects efficiency of the power converter supplying energy to the load.

14. (Original) The method according to Claim 13, further comprising the step of providing a lookup table stored internal or external to the microprocessor, wherein the lookup table includes pre-programmed or dynamically-created information based upon the monitored parameters.

15. (Original) The method according to Claim 12, further comprising the step of calculating efficiency by receiving the average input and output voltage from input and output voltage sensors and average input and output current from input current sensors to calculate input and output power, respectively.

16. (Cancelled)

17. (Original) The method according to Claim 12, further comprising the step of adjusting frequency of the device to provide maximum efficiency.

18. (Previously Presented) The method according to Claim 12, further comprising the steps of:

monitoring temperature of each module, and

continuously adjusting duty cycle until the temperatures in each module are the same.

19. (Previously Presented) The device according to Claim 12, further comprising the steps of:

monitoring average output currents of the modules, and

continuously adjusting duty cycle until the currents in each module are the same.